UNITED STATES PATENT AND TRADEMARK OFFICE

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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	09/845,349	ISHII, HIROTOMO
	Examiner	Art Unit
	COLIN M. LAROSE	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 22-24* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-10,12 and 22-24* is/are rejected.

7)☒ Claim(s) *5 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☒ All   b)☐ Some *   c)☐ None of:

   1.☒ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date *3/18/2008*.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____ .

DETAILED ACTION

Amendments and Remarks

1.   Applicant's amendments and remarks dated 14 April 2008, have been entered and made

of record.

Response to Amendments and Arguments

2.   Applicant has amended independent claims 1, 8, and 12 in order to further define the

claimed first and second conditions. However, the changes to these claims do not overcome the

previous § 102 rejections for substantially the same reasons as given in the previous Office

action dated 16 October 2007 and for the reasons given below. Accordingly, the previous

rejections have been maintained.

3.   Applicant maintains the argument that Huang sub-samples the image data only *after*

determining thresholds for it, whereas Examiner believes that Huang sub-samples the image data

prior to the threshold determinations. In the previous Office action, Examiner explained how

Huang is believed to sub-sample the image data prior to determining "lag" pixels, which are used

for a threshold determination. That explanation (pp. 2-5) is incorporated herein by reference.

Examiner believes that Huang's disclosure, while arguably ambiguous on this point, does fairly

suggest that the sub-sampling occurs prior to the thresholding determination.

        In column 6/12-49, Huang teaches that the pixel buffer pipe 42 sub-samples the image

based on H- and V-signals inputted thereto. After the description of the sub-sampling process,

Huang then states that, "[i]n addition to down-sampling (or sub-sampling) the input image data

21 to the predetermined resolution, the pixel buffer pipe 42 is also used in a dynamic

determination of foreground threshold values by the threshold determination unit 45" (column 6/50-54). The next passages (column 6/55—column 7/47) describe the selection of lag pixels and the threshold determination process. Thus, Huang describes the sub-sampling process and then states that "in addition to" sub-sampling, the buffer 42 also performs threshold determination. This order of description does suggest that sub-sampling is performed first, and then, in addition to the sub-sampling, threshold determination is *also* performed—i.e., subsequently performed.

While Huang's disclosure is not wholly conclusive, it appears that the most plausible interpretation is that the sub-sampling occurs first—for it would be highly inefficient to go to the trouble of computing the thresholds for each and every pixel only to later have a large number of those pixels and their accompanying threshold values discarded via sub-sampling. Even if the order of sub-sampling and threshold determination is not expressly stated in the reference, those skilled in the art would have readily inferred the preferred order from the context of the disclosure.

Accordingly (as stated in the previous Office action): Huang is considered to disclose the "first condition" insofar as Huang subsamples the input image data 21 via a conventional subsampling process that retains only a subset of the pixels in the image. Huang is also considered to disclose the "second condition" insofar as Huang specifies a number of pixels relative to a target pixel after the sub-sampling process. In figure 5, "lag" pixels 4-7 are relative to a target pixel 0 and are used to determine a threshold for binarizing the image data (see column 7/5-19).

4.   Applicant also argues that even if Huang's sub-sampling does occur before the threshold determination, Huang does not teach that the first and second conditions "relate to the original

image data" since the alleged second condition of Huang "is based on the sub-sampled data" (see

Remarks, p. 10). This argument is unpersuasive insofar as *all* of Huang's processing is performed

relative to an inputted original, and both of the "conditions" disclosed by Huang ultimately

"relate" to an inputted original image. All target and lag pixels utilized by Huang are contained in

the originally inputted image—they comprise the pixels that remain after sub-sampling is

performed on the original image.

Claim Rejections - 35 USC § 101

5.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

6.   The USPTO "Interim Guidelines for Examination of Patent Applications for Patent
Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as
follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive
> material." In this context, "functional descriptive material" consists of data structures and computer programs
> which impart functionality when employed as a computer component. (The definition of "data structure" is "a
> physical or logical relationship among data elements, designed to support specific data manipulation functions."
> The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional
> descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement
> of data.
>
> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and
> functionally interrelated to the medium and will be statutory in most cases since use of technology permits the
> function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d
> 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases
> computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to
> computer having a specific data structure stored in memory held statutory product-by-process claim) with
> Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).
>
> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element
> which defines structural and functional interrelationships between the computer program and the rest of the
> computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32
> F.3d at 1583-84, 32 USPQ2d at 1035.

7.   Claims 8-11 and 23 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter as follows. Claims 8-11 and 23 defines a "recording

medium" embodying functional descriptive material. However, the claim does not define a

computer-readable medium or memory and is thus non-statutory for that reason (i.e., "When

functional descriptive material is recorded on some computer-readable medium it becomes

structurally and functionally interrelated to the medium and will be statutory in most cases since

use of technology permits the function of the descriptive material to be realized" – Guidelines

Annex IV). That is, the scope of the presently claimed "recording medium" can range from

paper on which the program is written, to a program simply contemplated and memorized by a

person. The examiner suggests amending the claim to embody the program on "computer-

readable medium" or equivalent in order to make the claim statutory.   Any amendment to the

claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9.   Claims 1, 2, 6-8, 12, and 22-24 are rejected under 35 U.S.C. 102(e) as being anticipated

by U.S. Patent 6,766,056 by Huang et al. ("Huang").

Regarding claims 1, 8, and 12, Huang discloses an image processing

apparatus/medium/method (12, figure 1) comprising:

an input unit (scanner 11, figure 1) for inputting image data of an original image

composed of a plurality of pixels, each having a color data (color image data is input to the pixel

buffer pipe 42 via an input device; column 6, lines 19-21);

a storage unit (42, figure 4) for storing a first condition, wherein the first condition is met

if a pixel is in a prescribed absolute position in the original image data and a second condition,

wherein the second condition is met if a pixel is in a prescribed position relative to a target pixel

in the original image data (first condition: the pixel buffer pipe receive subsampling signals

from the sub-sample control module 41 and subsamples the image based on those signals; the

resulting image is a down-sampled version of the original that contains only a subset of the

original pixels; the pixels to be retained after subsampling constitute the first condition on

absolute positions of pixels in the image; see column 6, lines 22-30 and 50-54; second

condition: in figure 5, a number of "lag" pixels relative to a target pixel ("0") are identified; the

designation of these pixels constitutes the second condition on positions of pixels relative to a

target pixel; see column 6, lines 55-67);

a selector (45, figure 4) for selecting a target pixel included in the image data and also

selecting at least one related pixel which satisfies the stored first condition and the stored

second condition relative to the selected target pixel (column 7, lines 5-25: the threshold

determining unit 45 selects a target pixel 0 as well as related (lag) pixels 4-7, which must satisfy

the first and second conditions – that is, the related pixels are present in the subsampled image

(absolute condition), and they meet the condition of being "lag" pixels relative to the target

pixel);

a binarization unit (elements 43, 44, and 48, figure 4) for binarizing the target pixel into

one of two data values based upon a color data of the target pixel (i.e. color value of the target

pixel is compared to threshold during the binarization process) and that of the at least one

related pixel to the target pixel in the image (i.e. related pixels are used to generate the

threshold) to generate a binarized value (binarized value 54A is output by the pixel count

accumulator 48); and

a determination unit (22, figure 2) for determining whether or not the image has a

specified pattern, based upon binarized values obtained by said binarization unit (i.e. the mark

detection module 22 determines whether a specified patterns exists).

Regarding claim 2, Huang discloses the binarization unit obtains a color data for

binarization based upon the color data of the target pixel and that of the at least one related pixel

(column 7, lines 12-31: the "color data" obtained for binarization includes the pixel value of the

target pixel, and a color threshold that is based on the related pixels), and generates the

binarized value based upon whether or not the value indicated by the color data for binarization

is within a predetermined range (column 7, lines 20-31 the 3-bit binarized value of the target

pixel is generated based upon whether the target pixel's color value is within the color range for

a designated mark -- this 3-bit binarized value is then used to generate a binarized value 54A

composed of a single bit).

Regarding claim 6, Huang discloses the determination unit determines whether or not an image element having a shape similar to the specified pattern exists, based upon the binarized values, and when the image element is determined to exist, finely examines the shape of the image element to determine whether or not the specified pattern exists (column 12, lines 42-55: the mark detector detects circle patterns, and then finely examines those circle patterns by gathering statistical parameters).

Regarding claim 7, Huang discloses that when the image element is determined to exist, the determination unit inhibits to generate an image resembling closely the image received from the input unit (column 21, lines 45-52: e.g. photocopier functions are disabled upon detecting the image element).

Regarding claims 22-24, Huang's subsampling results in maintaining pixels in the image that are spaced at regular intervals (i.e. fixed with respect to an edge of the image), as is found in conventional subsampling.

Claim Rejections - 35 USC § 103

10.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11.   Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang in view of U.S. Patent 5,434,953 by Bloomberg.

Regarding claims 4 and 10, Huang discloses subsampling the image in order to reduce the image size, thereby defining a first condition (column 6, lines 22-30), and Huang also discloses a pixel which exists in a straight line including the target pixel extending in the predetermined direction and which is positioned within a predetermined range from the target pixel is the pixel defined in the second condition (figure 5: "lag" pixels, which are positioned within a predetermined range from the target, define the second condition).

Huang does not expressly disclose that every N pixel from a pixel at an edge of the image in a predetermined direction within the image is the pixel defined in the first condition.

However, at the time the invention was made, it was obvious to one skilled in the art that subsampling was typically effected by maintaining every Nth pixel from the edge of the original image in a predetermined direction (e.g. horizontal and vertical directions). Bloomberg teaches that "subsampling" is an operation that involves dividing an image into square blocks of pixels and then selecting a predetermined pixel from each block. The subsampled image is formed by combining each of the selected pixels, resulting in an image that includes every Nth pixel from the original image. Col. 4, lines 8-14. In view of Bloomberg's definition of "subsampling," whose skilled in the art would have known that Huang's subsampling constitutes maintaining every N pixel from the edge of the image in a predetermined direction within the image.

12.   Claims 3 and 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Huang in view of U.S. Patent 5,687,252 by Kanno et al. ("Kanno").

Regarding claim 9, Huang discloses the binarization step includes:

obtaining a color data for binarization based upon the color data of the target pixel and

that of the at least one related pixel (column 7, lines 12-31: the "color data" obtained for

binarization includes the pixel value of the target pixel, and a color threshold that is based on the

related pixels), and

generating the binarized value based upon whether or not the value indicated by the color

data for binarization is within a predetermined range (column 7, lines 20-31 the binarized value

of the target pixel is generated based upon whether the target pixel's color value is within the

color range for a designated mark).

Regarding claim 3 and further in regards to claim 9, Huang does not disclose the color

data for binarization is obtained based upon an average value between the value of the color

data of the target pixel and that of the at least one related pixel.

Rather, Huang discloses that the threshold is obtained based on only the related (lag)

pixels.

Kanno discloses an image processing system that includes the binarization of image data,

similar to the system of Huang. In particular, Kanno discloses a number of different binarization

processes that may be carried out in order to binarize image data (column 4, lines 1-13). Method

(5) involves calculating a threshold based on average values of both a target pixel and related

pixels (see figure 9 and column 9, lines 65+). The average value of the target pixel and its related

pixels within a predetermined range is then used as a threshold for binarizing the target pixel.

It would have been obvious to one of ordinary skill in the art at the time of the invention

to modify Huang by Kanno to include the target pixel in the calculation of the average value to

be used as the threshold, since Kanno shows that calculating the average value based on both the

target pixel and related pixels for the purposes of generating a threshold for binarization of a

single target pixel is conventional.

Allowable Subject Matter

13.   Claims 5 and 11 are objected to as being dependent upon a rejected base claim, but would

be allowable if rewritten in independent form including all of the limitations of the base claim

and any intervening claims.

Regarding claims 5 and 11, Huang is silent to storing a third condition defining a position

relative to the target pixel in a predetermined direction specified by a user, and wherein the at

least one related pixel includes a pixel satisfying the third condition. Huang's system does not

appear to involve any user interaction for specifying a predetermined direction corresponding to

a third condition defining a position relative to the target pixel, as claimed.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Colin M. LaRose whose telephone number is (571) 272-7423. If

attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian

Werner, can be reached on (571) 272-7401. The fax phone number for the organization where

this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000. Any inquiry

of a general nature or relating to the status of this application or proceeding can also be directed

to the TC 2600 Customer Service Office whose telephone number is (571) 272-2600.

/Colin M. LaRose/
Colin M. LaRose
Primary Examiner
Group Art Unit 2624
11 August 2008